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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/594,065

09/26/2006

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EXAMINER

WEBB, VERNON P

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/594,065	Applicant(s) TAKEUCHI ET AL.	
	Examiner VERNON P. WEBB	Art Unit 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 September 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) 9-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>08/08/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Application

1. This office action is in response to the filing of the amendment on 24 September 2008, Claims 1-11 are pending in this application.

Response to Arguments

2. Applicant's arguments with respect to claims 1-8 have been considered but are moot in view of the new ground(s) of rejection. Specifically, Applicant's perfection of the claim to foreign priority in the papers submitted 9/24/08 was persuasive. As a result, the new ground(s) of rejection follows.

Information Disclosure Statement

3. Acknowledgement is made that the information disclosure statements filed on 08/08/2008 has been received and considered by the examiner. If the applicant is aware of any prior art or any other co-pending applications not already of record, he/she is reminded of his/her duty under 37 CFR 1.56 to disclose the same.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1, 2, and 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. (U.S. Pub. Application 2003/0047737 A1) and further in view of Udagawa (U.S. Pub. Application 2003/0141509 A1).

7. Regarding claim 1, Lin et al. discloses a pn-junction compound semiconductor light-emitting device comprising:

- a stacked structure (items 10,14,16,18, 20, 22, 28, 30-32, and 34) including a light-emitting layer (item 20) composed of an n-type or a p-type aluminum gallium indium phosphide and a light-permeable substrate (item 10) for supporting the stacked structure (items 10,14,16,18, 20, 22, 28, 30-32, and 34), the stacked structure and the light-permeable substrate being joined together (pg. 2, paragraphs [0021-0024] and [0031]; Figs. 1-3).

8. Lin et al. does not disclose a pn-junction compound semiconductor light-emitting device wherein the stacked structure includes an n-type or a p-type conductor layer,

and that the conductor layer and the substrate are joined together, and the conductor layer is composed of a Group III-V compound semiconductor containing boron.

9. However Udagawa discloses a pn-junction compound semiconductor light-emitting device wherein the stacked structure includes an n-type or a p-type conductor layer (item 103), and that the conductor layer (item 103) and the substrate (item 101) are joined together the conductor layer (item 103) is composed of a Group III-V compound semiconductor containing boron (pgs. 2-3, paragraphs [0033-0034]; Figs. 1-2).

10. It would have been obvious for one of ordinary skill in the art at the time of the invention to form a pn-junction compound semiconductor light-emitting device as disclosed by Lin et al. wherein the stacked structure includes an n-type or a p-type conductor layer, and that the conductor layer and the substrate are joined together, and the conductor layer is composed of a Group III-V compound semiconductor containing boron as disclosed by Udagawa et al. thus providing a light-emitting device with improved structure having excellent electrical and emission characteristics (pg. 1, paragraph [0002], lines 5-9).

11. Regarding claim 2, Lin et al. as modified by Udagawa discloses a pn-junction compound semiconductor light-emitting device as described in regards to claim 1, wherein the conductor layer (item 103) has a bandgap at room temperature which is greater than that of the light-emitting layer (item 104) (pg. 3, paragraphs [0034]; Figs. 1-2; same motivation).

12. Regarding claim 4, Lin et al. discloses a pn-junction compound semiconductor light-emitting device as described in regards to claim 1.

13. Lin et al. does not disclose a pn-junction compound semiconductor light-emitting device, wherein the conductor layer is composed of a Group III-V compound semiconductor containing arsenic and boron.

14. However Udagawa et al. discloses a pn-junction compound semiconductor light-emitting device, wherein the conductor layer (item 103) is composed of a Group III-V compound semiconductor containing arsenic and boron (pg. 3, paragraph [0034]; Figs. 1-2).

15. It would have been obvious for one of ordinary skill in the art at the time of the invention to form a pn-junction compound semiconductor light-emitting device as disclosed by Lin et al., wherein the conductor layer is composed of a Group III-V compound semiconductor containing arsenic and boron as disclosed by Udagawa et al. thus providing a light-emitting device with improved structure having excellent electrical and emission characteristics (pg. 1, paragraph [0002], lines 5-9)

16. Regarding claim 5, Lin et al. as modified by Udagawa et al. discloses a pn-junction compound semiconductor light-emitting device as described in reference to claim 1, wherein the conductor layer (item 103) is composed of a Group III-V compound semiconductor containing phosphorus and boron (Udagawa, pg. 3, paragraph [0034]; Figs. 1-2; with the same motivation).

17. Regarding claim 6, Lin et al. as modified by Udagawa et al. discloses a pn-junction compound semiconductor light-emitting device as described in reference to claim 5, wherein the conductor layer (item 103) is composed of boron phosphide (Udagawa, pg. 3, paragraph [0034]; Figs. 1-2) (with the same motivation).

18. Claims 3 and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. (U.S. Pub. Application 2003/0047737 A1) and Udagawa (U.S. Pub. Application 2003/0141509 A1) as applied to claim 1 above and in further in view of Udagawa (U.S. Pub. Application 2003/0160253 A1).

19. Regarding claim 3, Lin et al. as modified by Udagawa discloses a pn-junction compound semiconductor light-emitting device as described in regards to claim 1.

20. Neither Lin et al. nor Udagawa disclose a pn-junction compound semiconductor light-emitting device wherein the conductor layer is composed of an undoped Group III-V compound semiconductor containing boron to which an impurity element has not been intentionally added.

21. However Udagawa et al. discloses a pn-junction compound semiconductor light-emitting device wherein the conductor layer (item 103) is composed of an undoped Group III-V compound semiconductor containing boron to which an impurity element has not been intentionally added (pg. 6, paragraphs [0043]; Figs. 2-4).

22. It would have been obvious for one of ordinary skill in the art at the time of the invention to form a pn-junction compound semiconductor light-emitting device as disclosed by Lin et al. as modified by Udagawa wherein the conductor layer is composed of an undoped Group III-V compound semiconductor containing boron to which an impurity element has not been intentionally added as disclosed by Udagawa et al. with at least the reason of forming a layer with excellent surface flatness and continuity (pg. 5, paragraph [0039], lines 14-18).

23. Regarding claim 7, Lin et al. as modified by Udagawa discloses a pn-junction compound semiconductor light-emitting device as described in regards to claim 1.

24. Neither Lin et al. nor Udagawa disclose a pn-junction compound semiconductor light-emitting device, wherein the conductor layer is composed of a boron-containing Group III-V compound semiconductor containing twins.

25. However Udagawa et al. discloses a pn-junction compound semiconductor light-emitting device, wherein the conductor layer (item 103) is composed of a boron-containing Group III-V compound semiconductor containing twins (pg. 6, paragraph [0044]; Figs. 2-4).

26. It would have been obvious for one of ordinary skill in the art at the time of the invention to form a pn-junction compound semiconductor light-emitting device as disclosed by Lin et al. as modified by Udagawa, wherein the conductor layer is composed of a boron-containing Group III-V compound semiconductor containing twins as disclosed by Udagawa et al. thus providing a device with excellent crystallinity between the conductor layer and light emitting layer (pg. 6, paragraph [0044], lines 14-18).

27. Regarding claim 8, Lin et al. as modified by Udagawa et al. discloses a pn-junction compound semiconductor light-emitting device as described in reference to claim 7, wherein each of the twins has, as a twinning plane, a (111) lattice plane of a boron-containing Group III-V compound semiconductor (Udagawa, pg. 6, paragraph [0044]; Figs. 2-4; with the same motivation).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VERNON P. WEBB whose telephone number is (571)270-3332. The examiner can normally be reached on Monday through Friday, 7:30 am to 5 pm, Eastern.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne A. Gurley can be reached on 571-272-1760. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lynne A. Gurley/
Supervisory Patent Examiner, Art Unit 2811

/V. Parris Webb/
Examiner, Art Unit 2811